

1279-1269 DRYDEN ROAD PROJECT, ENERGY ISSUES
As of December 6, 2022

The building is located and designed to be as close to energy neutral as possible, but it may be neutral or better:

1. It has a large roof facing south with 6/12 slope which is practically the ideal 30 degrees for our area (picture 4971). The south-side roof has a square footage of around 5,500 in the main building alone. This allows for at least 4,000 sq ft of solar panels, i.e., 360 square meters of panels.

In our area, the Sun delivers around 0,8-0,9 kW of power per square meter around noon in summer season, with good weather. A typical solar panel converts 19% of this power into electricity, i.e., the maximum power delivered would be around 58 kW. To calculate the average power delivered over a year, this number must be divided by 6.5 (this number is specific to the area, and accounts for night hours, morning/afternoon hours, and for bad weather). Therefore, the average power will be around 9 kW. This multiplied by the number of hours in a year corresponds to around 80,000 kWh of electrical energy per year, or to 238 kWh per month per apartment, or 8 kWh per day.

2. DOMESTIC HOT WATER: 8 kWh a day is more than an electric water heater needs to heat up 60 gallons of hot (130 F) water, a need that a family of four has. Since the proposed units are very small and will house a single person or two people at times, the need for domestic hot water will be a fraction of 60 gallons, maybe 1/3.

DAILY ENERGY USE: ~8 kWh / 3.

3. HEATING AND COOLING: Heating and cooling each unit will need less energy than heating the domestic hot water. This may sound strange, but this is what the data shows. I made an analysis of natural gas use on my 1062 Dryden Road property. The property comprises of 21 two- and three-bedroom townhomes with radiant floors as the source of heat. Heating these townhomes consumes around the same amount of energy as heating the domestic hot water! The units are 20 years old, and I have precise energy records for all these years. I will be glad to share the data upon request.

The proposed units are small, with an excellent, low ratio between the square footage of the exposed walls vs the unit square footage. For example, the outside walls of the main building measure around 7,000 sq ft and the floor area is around 14,000 sq ft which gives the ratio of 1/2. For comparison, a two-story house with a footprint of 30' x 50' has the ratio around 1. Moreover, the outside walls and ceilings will have sprayed foam insulation all around that guarantees the best R

values and virtually no drafts. The units will use mini-splits for heating and cooling. They will also have radiant floors which means that there will be significant insulation between the floor and the ground. Therefore, heating and cooling should account for less energy than heating the water, since the split was 50/50 at 1062 Dryden Road for a property with much worse insulation and a much worse ratio between the size of outside walls and the floor area.

DAILY ENERGY USE: less than 8 kWh / 3.

4. LIGHTS ETC.: Finally, the electricity used for LED lights, Energy Star appliances and computers always accounts for a small fraction of the total.

DAILY ENERGY USE: less than 8 kWh / 3.